Industrial Finishing

An Independent Publication Devoted To The Finishing of Industrial Products

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U.S.

With the Editor

BEFORE starting this journal the publishers visualized an ideal based largely upon suggestions of representative men in the industry. As a result we have endeavored to put into INDUSTRIAL FINISHING not only all the desirable features characteristic of a first-class trade journal, but to include an added element of personality which radiates a spirit of friendly interest, helpfulness and co-operation, to the extent that any member of our organization is willing to go out of his way to obtain information or perform any other useful service for its readers.

Evidence that this aim has been sensed by readers is revealed in many ways, one of which is the number of inquiries received asking for information about finishing materials, supplies, methods and processes; also letters submitting perplexing problems and various troubles experienced in both wood and metal finishing. Letters of this nature come to the editor's desk at the rate of one a day, and the remarkable thing about them is that the great majority are signed by someone higher in authority than the finishing foreman.

This is significant, for among other things it denotes two very important facts: (1) That of all the production departments in a manufacturing plant, it is the finishing process that excites the greater executive interest, and (2) that INDUSTRIAL FINISHING commands prestige, reader confidence and reader interest of the highest quality.

W. H. Rohr

Managing Editor

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Cleaning; Dipping; Baking; Spraying

Superintendent and Mechanical Engineer of Richmond Pressed Metal Works gives some interesting notes on modern metal finishing

By William S. Lyhne

MANY small plants do not realize the importance of good finishes on their work and the result is the work is delegated not only to inexperienced help, but to men who lack ability to experiment correctly to obtain the desired results.

Typewriter Castings

One concern polished their typewriter castings with dry emery and had trouble preventing them from rusting before they were japanned. This was overcome by rinsing the castings in sal soda, then immersing them in whale-oil soap. Later, when japanned, they were dipped in benzine.

Renewing Dip Material

Most men on the job, in the smaller plants, do not realize the necessity of adding some new japan or enamel to the vat every time they thin down the contents. The dipping takes out considerable pigment and when the material is thinned down again after thickening, it requires a "building up" of those properties taken out. Neglecting to do this causes the black japan to assume a greenish brown tint. The effect on red enamel (used as a dip material) is to cause it to take on a darkened color.

Baking Temperatures

Many concerns do not bake japan at high enough temperatures. I have found 420 degs. F. best for bringing out a lasting luster and real hardness.

Speaking of red baking enamel reminds me of an unusual thing I found by accident. I gave an oven operator a strip of steel, red enamel coated; by mistake he put it in with a charge of black japanned articles and baked it at 420 degs. F., which is way too high for red enamel. The result was a good black finish.

But here is the remarkable point! It was extremely flexible, as the piece of metal bent back and forth several hundred times, at 90-degree rounding angles, and the enamel showed no sign of fracture. This enamel would make an admirable black finish for springs, etc.

In one place it was necessary to japan thin brass shells. These bent easily and the finish chipped. After considerable experimenting this was overcome by giving the parts a flash of nickel plate. It had remarkably better adhesive results, even "standing up" well on the threaded parts. The salesmen didn't fail to capitalize on the result, either!

The Floatation System

I have noticed many places where concerns, who need large size vats of japan, fail to use the floatation system—which means filling the tank with water ex-

cept for a layer of a few inches of japan on top; japan floats on water.

Many times I have seen concerns washing off grease when, for their particular line of goods, it could have been burnt off more cheaply.

Material should always be warm before dipping, as the finish adheres better then, owing to the pores being more open.

Spraying Small Articles

In several factories I have noticed workmen placing parts to be coated on pieces of screening and then spraying them with lacquer, turning the screens in order to reach all points of the surface. Wonderful economy, however, has resulted in having a spindle that will start and stop by pressure of a foot lever. The spray gun is hung on a wire at the right height, and the worker picks up a piece, places it on the spindle, sprays it and then places it on another pan to dry.

Faster work is often possible with the push button type. The gun, in this case, is rigid and is pushed by the operator's abdomen, leaving both his hands free. Of course, this is only applicable when the work is small and the spray gun can be held stationary.

One more thing: The finishing department is often given the darkest spot in the shop, whereas it needs the very best light, if the operator is to obtain the best results.

Care of Air Compressor

All the care and attention possible should be given the air compressor to keep it in good running order. When this machine is not in action practically the entire finishing department is at a standstill. A good grade of gas engine oil should be used and this oil should be taken out and new oil put in at least once every month. A small amount of this oil should be placed in the passages leading to the piston twice a day, and a careful watch kept on the oil gauge.

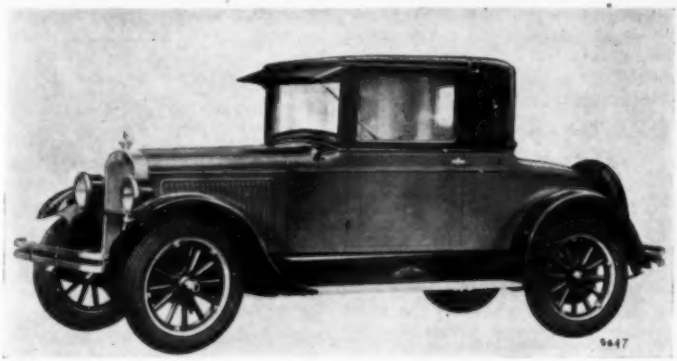
If there is too much oil it will be splashed onto the rings, causing them to become gummy; they will stick and considerable time will be lost in having to stop the compressor, take out the rings, clean them with naphtha and replace them again. If the oil gets too low there is danger of the compressor getting too hot and melting the babbitt metal at the base of the piston. Should this occur it would cause the loss of at least a half day's spraying—possibly more.

A good light oil should be used on the automatic air valve every other day. The cups on the motor are to be filled with a good cup grease or hard oil every morning and turned down half way; then at noon turn them completely down. All dust and dirt should be kept off the motor. If an air brush is not available for this purpose, a hand bellows can be used. The cleaner the compressor and the motor are kept, the better the service one will get out of them.—S. H. J.

Cleaning is the first operation in preparing the automobile body for painting. All dust, grease and rust must be removed.

J. L. Bergs Died

Mr. J. L. Bergs, industrial representative for S. C. Johnson & Son in St. Louis, passed away on April 23d. Mr. Bergs had been connected with the company for the past 5 years. The funeral services took place on Monday, the 26th, from the Scottish Rite Cathedral in St. Louis.



Motor Car Finishing

Superintendent of Paint and Enamel at Olds Motor Works describes modern finishing process on new cars, and calls attention to special features of importance in this work

By Leo J. Smith

THE first thing to be considered in the finishing of an automobile body is the primary cleaning operation. This work should receive careful attention. Slighting the cleaning will surely cause trouble, which sometimes doesn't show up until the lacquer is applied. The lacquer may refuse to dry, or it may crinkle and peel off.

In the case of oil undercoats, if oil or grease in small amounts are left on the metal, the primer may caseharden, and in that event everything will come off to the metal.

The condition of the metal governs the kind of system to be followed for cleaning. In this article I am discussing a new automobile body as handled daily in a modern automobile factory.

Cleaning the Metal

On closed bodies, where there is a considerable amount of soldering done and lots of acid used—which will always find a lodging place around mouldings and seams—the usual practice is to apply a generous amount of Deoxidine or some similar rust and grease remover, of which there are several on the market. When there are bad rust spots, steel wool can be used to good advantage.

The body should then be given a steam bath, wiped, and the seams, mouldings and all joints thoroughly blown out with air. It should then be wiped off with an alcohol rag, tack ragged and the primer applied at once.

I might mention here that it is good practice to have the mouldings washed with gasoline and primed on the under side before they are riveted to the body. This usually saves the painter considerable grief, as it stops

grease from working out from under the moulding; it also prevents lots of chipping along mouldings after the car has gone into service.

The Priming Coat

Next comes the primer, and there is lots of discussion these days about the merits of oil primers, and pyroxylin primers. Personally I am still betting on the oil primer. I am not alone on this either, as some very reliable people who make pyroxylin primer frankly say, "Well, people inquired for them, so we have them, but we are not pushing them hard. We are rather doubtful about the wearing qualities, and we know the oil primer, if given any chance at all, will wear good."

The pyroxylin primer has a field where there are no facilities for baking undercoats, and where lots of speed is required. I do believe, however, that to get the best results with pyroxylin primer, the body should be sand-blasted, and of course this costs money.

Incidentally, oil primer is cheaper to start with, as you can buy a good oxide primer from $1.20 to $1.45 per gallon, as against $2.75 to $3.50 for pyroxylin primer. Good oxide primer will "give" (come and go) with the metal, and stay put.

When a panel is dinged or jammed most pyroxylin undercoats will not cling fast in the crease of the abruptly dented place, if they have been applied directly to the metal. I have finished bodies dinged out daily, with no damage to the oil primer. I might say right here that pyroxylin sand surfacer can be put over an oil primer successfully and sanded smooth in three or four hours, but it takes longer to wet sand and costs more money than oil surfacers, which is another factor against it.

Glaze, Surface, Sand

The usual practice is to knife glaze all bad spots and then spray a coat of glaze over the entire surface. This is followed by one or more coats of sand surfacer—usually two—and then baked. The body then goes on the wet deck and is cut down with No. 240 "wet or dry" paper, and then finished off with No. 320 wet paper. After this the surfaces are thoroughly washed off and cleaned up, blown with air, tack ragged, and the body is again ready for the spray booth.

Some finishers use a flat ground coat before spraying the lacquer. I am not exactly in favor of this, as the first coat of lacquer enamel sinks into it and loses practically all of its covering qualities.

Lacquer Enamel Coats

The number of lacquer enamel coats that are applied, by different manufacturers, vary; some put on three, some four, others five. Of course, the color of material being used will enter into it also as an important factor. Not long ago I put eight coats of "Locust Cream" on a body before getting it solid. This was an exception of course. Sometimes a light colored enamel of a different tint can be used for a ground coat, but not always. It depends a great deal on the pigments used, for I have had them come through and throw the job off color.

Five well-lapped coats, with sufficient drying time allowed—putting three straight coats on and allowing each one to dry for

one-half hour, and then two more with a lapse of at least four hours before the car goes onto the polishing deck—this will practically guarantee a good looking job after it is polished.

Wet Sanding; Thinner

Five well-lapped coats will permit quite a little wet sanding, which will get rid of gun marks and break the outer shell of the enamel so that the Tripoli polishing compound can get right to work and make the final polishing operation rather easy, and cut the time involved to a minimum. After wet sanding, however, the job should be sprayed with a coat of thinner tinted slightly with the color used on the job. This will eliminate the sandpaper marks and cause the whole mass to level down in nice shape.

Striping

Next comes the stripe and mouldings. The mouldings are usually cut in with black lacquer enamel, and can be done with a broad liner, or papered and sprayed. The broad liner is the fastest on bodies.

Lacquer striping, only recently brought out, is the most durable. It has some faults, of course, as it is not easily removed if a striper wants to correct his line, but the superior wearing qualities make up for it.

Waxing

This brings the job up ready for the glass man and the trimmer with the exception of one operation, and that is waxing. Waxing will prevent bleeding, which is very pronounced on dark blues and to some extent on nearly all lacquer enamels. It keeps the moisture out and adds greatly to the general appearance of the job, but it is not being done to any great extent.

A Booster's Punch

Dear Reader: Do you realize that we have got to put our shoulders together and help each other more? We have got to help build up INDUSTRIAL FINISHING. Did you ever read an article from its pages in which there was not a punch somewhere for you or me? Send in your articles so that we brother foremen may get new ideas from one another.

Do you remember when the first spray and rubbing machine came? I do, for I was general foreman of an old piano plant. Well, my trouble started. Every man said that it would not work. The trouble was they did not want to make it work. I broke a green man in, and in a week's time he was O. K. The rubbing and spray machine has given us more work and it is easier done.

Let us read the pages of INDUSTRIAL FINISHING and get the good there is in it for us. Go after it with a punch and help make the INDUSTRIAL FINISHING one of the leading magazines. We can do it. I have never set out to conquer or to better myself that I have not done it. Don't tear off the wrapper and lay it up on the shelf. Read it through, for there may be in it the very thing that will put you on your feet. The manufacturers are at our service, so let us use them to solve our problems. Get busy!—L. S. Decker, Binghamton, N. Y.

Editor's Note: Thanks Mr. Decker; we hope more foremen finishers act on your suggestion.

Recent years have witnessed a speeding up of all types of finish.

The Use of Lacquer Cleaner

Attention is directed to the importance of cleanliness in connection with all spraying equipment, and information is revealed on how to use regular lacquer cleaner which is lower in cost than lacquer reducers

By W. H. Martindale

CLEANLINESS of spraying equipment, buckets, hose and other finishing room accessories is absolutely essential for good results with either clear or colored lacquer materials. Especially should care be taken to see that the gun, containers and fluid hose are entirely free of varnish, shellac or gums before lacquer is admitted to equipment formerly used with shellac or varnish, because the lacquer solvents will soften these partially dried materials and cause lumps to show up in the finish.

Before putting any spraying equipment into lacquer service it is well to clean it thoroughly by washing with "lacquer cleaner". Formerly it was customary to use a regular lacquer reducer for this purpose, but the lacquer cleaner can now be used with equal results at much less cost.

In addition to this preliminary cleaning operation, the material hose should be drained of lacquer each night and washed out immediately with lacquer cleaner to prevent the lacquer from hardening in the hose where it may soften again later and be blown onto the work, causing dirt nibs and similar troubles.

Cleans Equipment

In fact, all spraying equipment, buckets, containers and other equipment in contact with lacquer should be cleaned thoroughly with lacquer cleaner before and after using lacquer. The gun should be taken apart during this cleaning operation to make sure that all working parts are clean. Especial attention should be given to the nozzle to see that it is kept free from partially hardened lacquer at all times. Failure to observe these precautions will mean trouble with uneven and dirty work eventually.

Lacquer cleaner may be used advantageously also for removing lacquer from any surface that it is desired to clean down to the bare wood or metal, even though the lacquer is hard and dry. A good lacquer cleaner contains solvents for both nitro-cellulose or gun-cotton, and varnish gums or oils, so it easily softens and removes hardened lacquer films.

Cleans Metal Surfaces

Another wide field of use for lacquer cleaner is for washing grease, wax, oil or other greasy materials from the surface of metal work before applying the first coat of lacquer. The surface must be absolutely free from such foreign materials before lacquer will adhere to it and there is no better way to insure good adhesion than to wash the surface thoroughly with lacquer cleaner before coating it.

Care should be taken, however, to change the wiping cloths frequently and to not use the same cleaner too long; otherwise the grease and oil removed from one

surface will be spread over another surface and give poor results. Whenever the cloths or cleaner show any signs of becoming oily they should be discarded and a clean supply obtained.

The advantages of a lacquer cleaner over a regular lacquer thinner are quite pronounced in many ways, in addition to a saving in cost. It has a high boiling point and consequently holds the work wet for a long period of time, when removing hardened lacquer films. For the same reason very little of it is lost by evaporation when standing in an open vessel.

As mentioned previously, it contains solvents for both nitrocellulose and gums, consequently it softens and removes lacquer, varnish or shellac promptly. While it has the customary lacquer odor, it is very mild and its fumes have no bad effect upon the health.

Skin Protection

While a good lacquer cleaner does not have the harsh effect upon the workman's hands that many solvents have, it is sometimes advisable for men who are using it constantly to rub some extra oil into the hands and arms before starting work. This increases the supply of available oil in the skin and prevents the natural oils from being washed out too much.

A good salve for this purpose is one which was worked out some time ago by the Educational Bureau of the Paint and Varnish Manufacturers' Association:

Lanolin (Adeps Lanae Hydrosus)	25 parts by weight
Petroleum	25 parts by weight
Stearine	25 parts by weight
Glycerine	25 parts by weight

This salve, which is not rapidly attacked by solvents, should be rubbed into the skin on the hands and arms before starting to work. After washing up at night a little more of the salve can be rubbed into the skin.

It is a fact that certain individuals are more susceptible to troubles from contact with paint, varnish and lacquer solvents than others and the above is intended primarily for those whose skin is easily affected by solvents.

Not a Thinner or Reducer

One important point should not be overlooked. Lacquer cleaner should never be used as a thinner or reducer for lacquer materials in place of the regular reducer that is recommended by the manufacturer. It is designed for use as a cleaner and remover, and is not suitable for use as a reducer. Some manufacturers give their lacquer cleaner a distinctive color tint, so workmen can readily identify it and make no mistake in using it.

Exports and Imports of Finishing Materials

Materials for finishing and for making finishes, play an important part in our world trade, as is shown by figures given in a special pamphlet of the Chamber of Commerce of the U. S. covering our world trade in 1925.

In the export list we have, for example, rosin exported during 1925 to a total value of $18,889,000; paraffin wax to a total of $18,596,000; spirits of turpentine, $11,346,000; paints, stains and enamels, $7,904,000; chemical pigments, $7,679,000. These are all included in the list of 100 chief exports in value. There are probably many other items such as brushes and spraying apparatus and things of that kind.

On the import side—things we

buy from other countries and bring to this country in large quantities—the highest item on the list is flax seed or linseed, from which we make linseed oil, with a total value for 1925 of $39,683,000. Then comes Chinese wood, nut or tung oil, with a total of $11,386,000; shellac with a total of $10,164,000. These are materials for finishing proper.

It is also worthy of note that many of the bristles used for making brushes come from China and Russia, and the total imports of bristles for 1925 amounted to $8,254,000. There is also a listing of essential and distilled oils imported, with a total value of $6,345,000.

Also in the imports, as in the exports, there are perhaps many items imported which are not listed in the hundred chief imports, which if all summed up would make an important showing. As it is, however, there is enough to demonstrate that finishes and finishing materials constitute an item of importance in the export and import trade.—J. C. Taylor.

New Air Filter

The Gast compressed air separator illustrated herewith, partly by cross section, is a new device for use on compressed air pipe lines leading to spraying machines, rubbing machines and any equipment requiring the use of clean dry air. Its cast iron shell is 4 1-2-in. in diameter and 8-in. in height and is tapped to receive standard 3-4-in. iron pipe threads. The device is usually installed on each individual line, at a point near where the hose is connected, as for example, one to each spray booth, one to each rubbing machine, etc.

Compressed air enters the separator at the point shown in the lower left hand corner, passes upward and strikes the top of the inner chamber, where it is then deflected downward and out the slots through several thicknesses of coarse mesh brass screen; striking the wall of the outer chamber the "flow" of air is deflected up and out the discharge opening at the top.

As the air zigzags through the several thicknesses of screen, the heavier particles of dirt, oil and moisture collect on the individual strands and drop into the dead space created in the bottom of the chamber by the passage of air. To forestall any capillary action, a projection is cast in the upper portion, this forming an upper chamber which is at all times entirely free of any trace of moisture.

The drain opening is fitted with a collecting chamber consisting of an 18-in. length of drop pipe equipped with a shut-off valve. A smaller opening, also fitted with a 16 or 18-in. length of small pipe and an air cock, serves merely as a low point drain. This device is a product of the Tirrell Mfg. Co., Bridgman, Mich., and is distributed by Smith-Monroe Co., South Bend, Ind.

Wood Lacquers

That give a finish that lasts. We are pioneers in making dependable lacquers since 1857. Send requirements, get our prices.

Chas. Cooper & Co.

90 Worth St., New York

Works—Newark, N. J.

Colored Furniture Finishes

Furniture manufacturers and their foreman finishers are herein presented with a choice of several combinations of materials and methods of finishing in colors, to produce the beautiful decorative effects which are now so popular

By R. L. Masterson

ENAMELED and decorated furniture is in vogue again. Nearly every modern home has its breakfast room or breakfast nook for which decorated furniture is especially well adapted. Some people also prefer enameled bedroom suites to harmonize with the decorations, while the furnishings for the sun parlor are almost universally finished in colors to add cheerfulness and life to the setting.

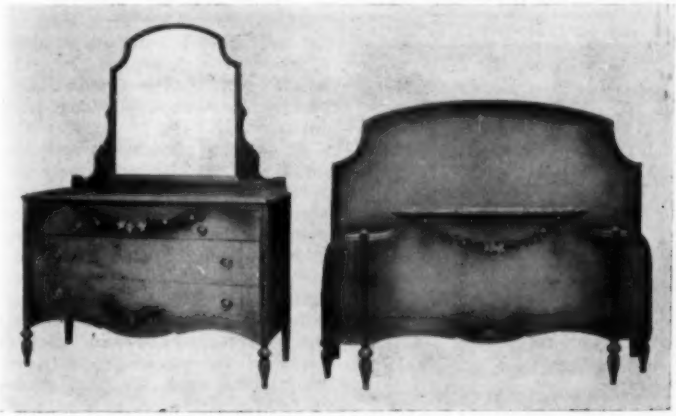
There are several methods in use for obtaining solid color finishes on furniture each of which is better suited for use under certain conditions than under others.

No two furniture manufacturers are working for exactly the same result. Methods of application vary; shop conditions differ widely; the type of furniture, the use to which it is to be put, its selling price and other such details all have their bearing upon the best methods and materials to use in each case.

Realizing all this, I am giving below several suggested systems for producing colored finishes on furniture and similar objects. These may be followed exactly or varied slightly according to the user's wishes.

Egg-Shell Enamel Finish
(Paint Material)

The usual procedure of producing an egg-shell or semi-gloss enamel finish with paint materials is to apply one or two coats of a paint primer, followed by



one or two coats of an egg-shell or semi-gloss paint enamel, allowing one day between coats.

Both the undercoat and egg-shell enamel should be finely ground and have good building up or filling qualities to hide the grain of the wood. They should have the ability of leveling out smoothly when either sprayed or brushed, and should dry sufficiently hard over night to be sanded.

While the egg-shell enamels usually dry with a velvet luster, they should be so constructed as to withstand rubbing with oil and pumice or water and pumice the next day after application, where a rubbed finish is desired.

Striping or decorating can be done with oil colors, or decalcomania transfers can be applied. If desired the work can be antiqued, shaded or blended with harmonizing shades of enamel.

Gloss Enamel Finish
(Paint Material)

The usual procedure in obtaining a gloss finish with paint materials is to apply one or two coats of undercoater followed by one coat of gloss enamel. The gloss enamels should be especially prepared for furniture work and should be applied either by brushing or spraying, and still dry hard over night. The fineness of grind and the care in manufacture have a great deal to do with their leveling down to a smooth, deeply lustrous finish that is hard and tough but at the same time wear resisting and durable.

Striping or decorating can be done on top of the gloss enamel with any harmonizing shade of gloss enamel, or transfers and shading or blending can be made use of.

Finishing novelty furniture in lacquer with spray equipment.

Varnish Finish
(Paint Material)

The use of clear varnish in finishing colored or decorated furniture is confined almost entirely to the purpose of providing a protective coat over transfers or decorations put on with japan colors or oil colors. The usual procedure is to apply one or more coats of colored undercoat enamel of the desired shade, allowing 18 to 24 hours between coats. Then apply the desired decorations and when dry apply one or more coats of clear varnish, allowing 24 hours or more for each coat to dry. Then if a velvet or rubbed effect is desired, the varnish can be rubbed with fine pumice stone and oil or pumice stone and water.

A varnish for this purpose must be hard drying, pale in color and durable. The exact conditions under which the varnish is to be used, the colors over which it is to be used, and similar information should be carefully considered before deciding which is the correct varnish for the individual conditions, as the color of the varnish will have some effect upon the final shade of the finish.

Paint Undercoater—Clear Lacquer Finish

(Paint and Lacquer Materials)

A lacquer finish possesses many advantages that are not obtainable in paint finishes. From the furniture manufacturer's point of view, the quick-drying feature of lacquer materials is interesting, since it means increased production and decreased space needed for storing partially finished work while waiting for the next coat. A considerable saving is also made by the much smaller investment in stock in process of finishing, and in the shorter time between the purchase of raw materials and the shipping of the finished article, which means quicker turnover of the money invested.

Furthermore, due to its print resistance, toughness, waterproofness and ability to stand extremes of temperature, lacquered work does not become damaged so readily while passing from the finishing department to the consumer. Consequently, it is sometimes possible to use less expensive methods of packing or crating.

The usual procedure in securing a combination paint and clear lacquer finish is to use one or more coats of colored undercoat enamel followed by one or more coats of clear lacquer. The undercoat enamel should be of the proper shade to give the desired colored effect to the finished article. Any decorative work should be done on the undercoat enamel before the lacquer is applied, and it should be kept in mind that the clear lacquer will alter the shade of the coatings under it slightly, depending upon the transparency of the clear lacquer.

One coat is sufficient for most work, but where an extra good surface is desired, or where there are extremely large pores to be filled, it is advisable to apply two or more coats. Each coat of undercoat enamel should dry over night (18 to 24 hours) before the next coat is applied, or before lacquer is applied.

It is advisable to sand the undercoat smooth to remove any spray gun pebbles, brush marks or particles of dirt before applying succeeding coats. Decorations, stripes or antique effects should then be put on with japan colors of the desired shade, which have been reduced to the proper consistency with a mixture of equal parts of turpentine and solvent naphtha.

Where absolutely necessary, enough oil can be added to aid in the blending, or oil colors themselves may be used for decorative effects if sufficient time is allowed for them to dry bone hard before lacquer is applied over them. Five hours or so is long enough for japan colors to dry, but oil colors would require a considerable longer time, the exact time depending upon the type and proportion of oil in the film.

After the decorating has been done, one, two or more coats of clear lacquer should be applied full body by spraying. For the very best results only one coat a day should be applied, although for rush work two coats may be put on in one day. After the last coat has dried over night it can be rubbed with pumice and oil or pumice and water to a dull rubbed finish and then polished with rotten stone and oil if desired.

Japan Color Undercoater—Clear Lacquer Finish

(Paint and Lacquer Materials)

Where the wood is very smooth

and not much filling properties are needed in the undercoater, some people have found it quite satisfactory to spray a coat of the desired shade of japan color, which has been reduced with a mixture of equal parts of turpentine and solvent naphtha, next to the wood, to obtain the colored effect. This is allowed to dry about five hours and then decorated with other japan colors as the taste may demand. After the decorations are thoroughly dry, one or more coats of clear lacquer are then applied as outlined under the system of "Paint undercoater—Clear Lacquer Finish."

The japan colors would best be made especially for use under lacquer materials. Their fineness of grind, adhesion and ability to resist the solvent action of lacquers, together with their strength and beauty of color, are the main points to be watched.

Paint Undercoater—Lacquer Enamel Finish

(Paint and Lacquer Materials)

Some people prefer to use colored lacquer enamels for finishing instead of clear lacquers, because more delicate tints can be obtained and because a thicker film can be put on at one application. The popular method of doing this is to use a paint undercoater in the same way as where clear lacquer is to be used as the finishing coat.

After the undercoat is dry and has been sanded smooth one or more coats of lacquer enamel should be applied, depending upon the thickness of film wanted on the work. If no rubbing and polishing of the lacquer enamel is to be done, one coat will sometimes be sufficient, but it is better to use two or more coats when the finish is to be rubbed, to lessen the danger of cutting through.

There are a great many methods used for rubbing lacquer enamel, each of which is better suited to some conditions than others. Some finishers use fine sandpaper and water; others use pumice stone and water or pumice stone and oil, while others use various trade-marked rubbing compounds.

Of course, it is not necessary to stripe and decorate on top of the undercoat when using lacquer enamel, as would be done if clear lacquer were used for finishing. Decorations on colored lacquer enamels are usually put on with a harmonizing shade of lacquer enamel which has been reduced to the proper consistency with lacquer striping reducer, this being the next operation after the rubbing process. If desired, the lacquer enamel can be polished still higher with rotten stone and oil or with a polish, after the stripe has been allowed two or three hours to dry.

Lacquer Undercoater — Lacquer Enamel Finish

(All Lacquer Materials)

If the highest resistance to marking and printing under hot dishes is wanted, the system to use is that of lacquer enamel all the way out from the bare wood. This system will also permit of the greatest speed, since a coat can be applied every hour, if desired. The wood must be close-grained and very well surfaced, however, because lacquer enamels do not possess the filling properties of paint, undercoats and enamels.

The lacquer primer should adhere tightly to the wood, cover solidly in one coat, and have as

good filling properties as possible. As a rule, lacquer primers are reduced at the rate of about three parts of primer to one part of lacquer enamel reducer, and allowed to dry five or six hours before the next operation, although for extra rush work it can be recoated in a shorter time.

After the lacquer primer has dried and has been sanded where required, it should be followed by one or more coats of lacquer enamel, applied and dried as outlined under "Paint Undercoater —Lacquer Enamel Finish," above.

Handling Printed Plates

Much good work is neutralized and often a huge waste entailed because of finger-marks on printed metal plates. The skilled operator usually knows how to handle his work, but much of his effort is nullified because of inexperienced, careless workmen. Printed name-plates and kindred work are easily spoiled when the fingers come in contact with the printed surface.

The object is to manipulate the plates in such a way that the cut ends of two sides come between the palms; in that way there is no possible contact with the printed work. As these are caught from the fly of the printing press, each plate should be carefully placed on a ready rack. There should be no hurry at this operation, but the employee should be alert enough to keep up with the printer. It pays to have a steady, experienced worker to handle the plates, rather than some carefree boy who does not take proper interest.

When plates are dusted with asphaltum powder, the men or boys invested with responsibility here must exercise caution too. Sometimes brush or duster marks are visible because of carelessness. Employees at this operation also should keep their fingers away from the printed surfaces.

Another hindrance against good work is that resulting from the surfaces of two plates making contact with one another while on the rack. When setting them up on the rack it is well to skip a groove every time, so that the printed surfaces will clear one another. Through this means the surfaces, by reason of the better passage of air, tend to dry more quickly too.

The man at the drying ovens, when he is an experienced operator, usually has full regard for the careful handling of plates, but it is not always so when there is a newcomer, or when he has an assistant. Each employe must contribute his part.

Rags or waste, and even gloves, should be dispensed with when handling wet plates. These materials, or lint from them, are bound to come in contact with the printed faces of plates, and, so far as gloves are concerned, these really hinder the man handling the product.

Plates of light gauge metal usually give the most trouble, because of their springiness, as is particularly true of very thin plates and plates of large dimensions. They tend to sag and touch one another while on the rack. It is at such times that special precautions must be taken.—F. V. Faulhaber.

Good paint or varnish or lacquer, like fine clothes, have a way of showing a smart appearance long after inferior goods have worn out.

Brushing Pyroxylin Lacquer

Practical Finisher gives notes on his experience with brushing pyroxylin lacquer on wood surfaces, and tells how to use it to obtain satisfactory results

By A. F. Eibell

AFTER trying practically all brands of brushing lacquer that have appeared to date, I find that while some of them are evidently "made to sell," the majority give such good results as to convince any one that this form of pyroxylin product is here to stay. It should prove of value to small shopmen in both the auto refinishing and furniture lines—that is, those who are progressive but still can't see their way clear to put in a spraying outfit.

One feature in particular, which should appeal to the furniture man, is the possible use of brushing lacquer for table tops, giving as it does a quicker, better and more serviceable job than was ever possible with the old style shellac and varnish finish.

Stain, Fill, Shellac

Following the usual procedure of sponging the surface, proceed to stain the wood with water stain. When this is dry, fill with a good silex filler let down with naphtha, and then do the usual rubbing across the grain to remove the surplus material. If you are one of those who use analine dye to get color in your filler, don't do it with this material; go back to the old scienas, umbers, vandyke, etc. In other words, stick to mineral colors, because lacquer will bleed out every trace of analine and leave your filler in the grain as white as it came from the can.

When the filler is good and dry (be careful about that) give it a fair coat of shellac, say a 2½-lb. or even a 3-lb. cut. This will seal the job and do away with any chance of the lacquer bleeding your stain, although if it is applied good and hot and is thoroughly dry before the filler is applied, there is not much danger of its coming through—or more probably, of this "inquisitive" article (lacquer) getting to it.

Some finishers use a wash coat of shellac over the dye or stain before applying filler, but I believe this practice causes much of the trouble with pin-holing. This coat is not always applied as thin as it should be, and as a result it often bridges over some of the pores of the wood and later causes trouble.

Spreading Brush Lacquer

As for the pyroxylin finish—its application, number of coats, etc.—this remains a problem, but with the work brought up to this coat of shellac, three coats of lacquer properly applied will give a good commercial job. Now as to the application, you will need to use all the care and skill at your command. Get a large long-haired, well chiseled brush and go after it.

If you have the right kind of stuff you can handle it quite easily by using a well loaded brush and not wiping back over your work. Continue spreading material, always keeping the edge wet. (Now for a howl from

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some one?) If you have decided on three coats and you have, of course, laid the first coat on with the grain, put the next one on in the opposite direction; then the final one again with the grain, and when it's dry, it is ready to surface.

Now, really, this cross-coating will do more to body up a good full surface with three coats, than four or even more laid all one way, for no matter how you lay a pyroxylin product, whether by brush, spray or dip, each coat is going to bite into all the preceding ones; by crossing alternate coats, you reduce the brush marks and so make easier surfacing.

Comparative Costs

As to cost, if you have taken in all that the salesman said, you will be looking for big reduction. Then, if you use the goods as they come from the manufacturer, or with but little thinning, you will likely be disappointed in the saving; but if you will use this material in the right consistency—rather too thin than too thick—and heap the stuff on full and let it alone, you will be surprised how much thinning it will take and still body up and hold its gloss.

Then, if you take out your lead pencil and do some figuring, allowing for quick turnover, floor space and capital, you will be agreeably surprised. Again, if you should cut through when rubbing, note how easy lacquer touches up, and how it bites right into other coats. If skillfully applied, it requires but little work to make the added "repair" lacquer match evenly the balance of the finished surface.

On Old Work

For old work, naturally it will call for different handling, so if you use any of the commercial removers (other than alkali brands) you will have to be more than ordinarily careful. In fact after the clean up with benzine, gasoline, or otherwise, you are perhaps accustomed to giving the surface a good alcohol wash, wiping dry as you go, and then coming on up as on new work, excepting, of course, the water stain.

Brushing on the stain-filler as a first operation in finishing low-priced dressers.

One may use either alcohol, or acid, or even oil stain, if you let it get good and hard before continuing the work. In fact, if you can get the color you want with oil colors, and if you let it dry well, it works best of all for old work, where the finish has been removed to the wood.

In a few instances in my experience, when walnut or mahogany was to be finished with but little staining required to get the color ordered, the wood was dyed, a wash of shellac was applied, and this was followed by the bodying up with lacquer, six coats being applied—four with the grain and two opposite. Then the whole works was cut to a surface and polished. The result was the most perfect top imaginable—full surface, perfect polish

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We also make a complete line of Rubbing and Polishing Varnishes—Flat Varnishes—Gloss Coaches—First Coaters—Enamels and Orange and White Shellac.

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Columbus, Ohio

and tough enough to stand hard usage, hot dishes, etc. But as long as our friend the woodworker refuses to do his work perfectly, I would not recommend this process for a moneymaker.

Smooth Surface To Start

With the advent of pyroxylin products, no matter how applied, the right job from the wood shop has become a necessity. Regardless of how few or how many coats of this material you put on, if the surface is not there to start, this finish will show it up, as each coat merges into the others. No matter how many coats you put on, it stands to reason it must go on a level surface to surface up right.

Again, if you have to use putty, better take some mineral and pyroxylin to do it with, for pyroxylin laquer will discolor any of the ordinary putty or stick shellac. In fact, this is a funny compound and after writing all I have, I still feel I have said but little, and that only by close cooperation with the manufacturers can we avoid going through, with this material, many of the blunders made with its older brother, the spraying lacquer. Still, to all those who are not moss-grown, but believers in progress, it will soon be worth all the experimenting failures, etc., expended on it.

New types of varnish offer the advantages of quick drying.

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Varnish Facts

Varnishes are exceedingly sensitive and are made by the manufacturers in many degrees of hardness or elasticity, therefore, they must be carefully handled, and used with knowledge. All varnish requires time to mature before using. The body or viscosity of varnish as well as the elasticity, improves with age.

It is essential to prepare the ground work for varnish in the proper manner and according to different types of varnishes. For instance, a too elastic varnish, applied on a hard, non-elastic surface, will not preserve the surface. A hard varnish, applied to elastic undercoatings, results in a pattern of fine hair-line cracks or fissures.

All paint and varnish coatings are affected by climatic conditions—extremes of heat and cold, dry and wet—and this fact must always be taken into consideration. Materials used in the south are sometimes not at all satisfactory in the northern climates.

Condensation of moisture on a varnished surface, while it may not be apparent to the eye, will retard the drying of the varnish and cause blooming if there is no circulation of air. It may also have the effect of decomposing the surface film. This film of moisture will also prevent the second coat of varnish from adhering firmly, and may cause trouble by cracking—J. H. S.

The advantage of lacquer striping in automobile work is that the lacquer penetrates right into the body material and allows polishing with the body.

This is the day of smart colors for the automobile—and furniture.

BREVOKRAK is a complete lacquer process which produces unique effects commonly known as "krakle".

A WIDE RANGE of beautiful color combinations give the appearance of either antique or leatherette finishes which are now in vogue.

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(*BREVOLITE* Wood lacquers and lacquer enamels meet the demand of the wood finishing trade for filling qualities and durability—samples on request.)

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Modern Sprayer Methods

Practical and experienced foreman finisher reveals important information regarding correct spraying practices, and tells how to avoid troubles and errors commonly encountered

By John H. Steffen

TO THOSE not familiar with the use of air brushes a little time is required to master the control and acquire the proper knack of using the spray gun to best advantage. Daily practice will reveal new uses and unlimited possibilities.

Anyone, so inclined, can be taught to become an effective spray operator in a very short time, whereas it used to require months and often longer to develop a first class brush hand.

Regulate Air Pressure

With an efficient spray operator and the air pressure regulated to conform to the consistency of the material used, it is easy to obtain a smooth and uniform coat without any sags, runs, fatty edges or thin spots. Regulating the air pressure is very important; it must be regulated to conform with the consistency of the material used.

Without properly regulated air pressure the material will be either broken up too fine or not fine enough, resulting in a coarse, uneven, spitting spray, and a pitty, pebbly, rough finish. When the air pressure is properly regulated it breaks the material into a fine smooth spray, which gives a smooth uniform spread of finish.

Since different materials require different air pressures, the operator will find it necessary to vary the pressure accordingly. Varnish requires a pressure of from 70 to 90 lbs.; shellac from 60 to 70 lbs., and lacquer from 40 to 70 lbs.

Clean Air Necessary

It is very important that the air line be free from water or oil. The air line should slope away from the spray booth. The transformer set and the receiver should both be drained off occasionally. A filter placed in the main air line is very essential so that all moisture, oil and sediment will be removed before they reach the spray. This filter should be drained four times daily and cleaned twice a month, removing the excelsior and re-

Using an artist's cup gun for painting decorative designs according to guide established by openings cut in thin gage sheet metal mask, which the operator presses lightly against the composition-board panel as it sags gracefully toward spray booth fans.

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Whether on new car or an old one, ARMORLAC Finish retains its lustre and beauty throughout strenuous car use—a point of recommendation that develops new car sales and boosts business for the refinishing shop. A dependable lacquer system of finishing backed by one of the oldest paint and lacquer manufacturers in the U. S.

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placing with new excelsior, as clean, dry and fine as possible.

If there is oil in the air line, the piston rings of the air compressor are probably leaking and should be attended to at once. The oil in the air compressor should be changed every month; the best grade of gas engine oil is needed for best results.

Clean Appliances

The fluid hose should always be given a thorough cleaning at the end of the days work. If shellac or shellac substitute is used, flush the hose with alcohol so that no particles are left in the hose to cause clogging of the spray when work is resumed next day.

Where a first coater or varnish is used, flush the hose with naphtha or turpentine and place the hose full length on the floor over night. This method prevents the hose from cracking or becoming soft in places, as usually happens when it is hung up or bent in any manner. Spray guns should be placed in the proper solvent over night and given a thorough cleaning and oiling before going into service next day.

What Materials Spray

Practically every material used in the finishing department can be successfully sprayed. Spraying is used to some extent for applying stains, but due to the extra quantity used on small objects, where considerable of the stain goes past the work, this method of application is confined mostly to use on large surfaces.

The spraying method is also used very successfully to produce the popular two-tone or shaded effects, wherein certain parts of the finished surface are made to appear darker than others, the two shades being gradually blended into each other. By this method, effects can be produced which would be very difficult to match by any other process.

In many plants that manufacture a standard line of articles on a quantity production basis it is customary to take material directly from the shipping drum by compressed air, the drum heads being reinforced with blocking, cross beams and tie rods.

Filler is successfully sprayed by some users, who are entirely satisfied with this method. Pigment coats, various undercoats, enamels, clear and color varnishes and shellacs—all these can be sprayed with better results, and with a great saving of time and labor over the brushing method.

Spraying Lacquer

In the spraying of lacquer, make sure that the spray gun, fluid hose and containers are en-

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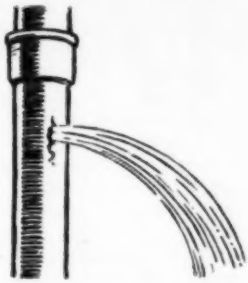

Plug the leaks in your surfacing costs!

ARE unexpected finishing problems constantly arising—necessitating constant changes in your operating plan—even when you are convinced you have an excellent finish?

A good finish—even an excellent finish—is not enough. Unless your finish is *scientifically adapted* to the surface which it is to cover, the best finish in the world cannot be regarded as the *right* finish.

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DU PONT

tirely free from varnish or gums before using lacquer, because the solvents will soften these and cause lumps to appear in the finish. The material hose should be drained of lacquer each night and washed thoroughly with reducer to prevent the lacquer from hardening in the hose, where it may be softened again later and blown on the work, thus causing dirt nibs and similar troubles. The spray gun should be taken apart during this cleaning operation to make sure that all working parts are clean. Special attention should be given to the nozzle to see that it is always kept free from partially hardened lacquer. Failure to observe these precautions will mean trouble with dirty and uneven work.

Spraying Varnish

In the spraying of varnish it is very important that the heater be in proper working order, as compressed air is very cold and contains much moisture. The temperature of the heater should be between 100 and 120 degs. F. The air must pass through the heater so as to subject both air and varnish to the same temperature.

The temperature of the varnish room should at no time be less than 72 degs. F. Under these conditions a smooth, even, uniform finish is assured, due to the fact that warm varnish, sprayed with warm dry air in a warm room, will flow out while drying.

Finishing Display Fixtures

This question and answer regarding finishing of artistic window display fixtures with bronze powder, in varnish or lacquer, reveals interesting information on a subject of importance

By T. E. Moorefield

THE following inquiry recently came in from an Eastern concern that manufactures artistic window display fixtures:

"Kindly send to us the best method and formulas for applying bronze finishes to small wood window fixtures. We want to obtain a smooth, even, satiny finish with the minimum amount of labor.

"Also the best formula for 'washer' to get antique gold effect on said fixtures. We are interested in obtaining the same type of results on flat panel surfaces, such as window backs, where it is not practical to use our spray nozzles.

"We are having a bit of trouble in obtaining a clear, even, clean surface on our varnish rubbed jobs in store fixtures. Many of the large flat surfaces are a bit smutty after having been rubbed with pumice and oil. We would like to know the best method of washing said surfaces to get a 100 per cent job."

ANSWER: The exact procedure to use on these small wood window fixtures depends a great deal upon the quality of finish desired. A coat of bronze powder mixed with clear lacquer, applied directly over the bare wood, would satisfy some people, whereas others would want the surface to

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ZAPON

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be filled up smooth and free from any pore marks or indentations in the wood before the bronze coat was put on.

For Bronzing Liquid

In such a case, it is advisable to spray one or more coats of surfacing material, similar to the sanding surfacers used on automobile bodies, on the wood. Then sand down smooth, and apply a coat of the bronze powder mixed with clear bronzing lacquer. Either system will give an even satiny finish, although the one in which the surfacing coats are used will naturally give a smoother finish than if no undercoats are used below the coat of bronze powder.

On surfaces where it is not practical to use the spray gun, the same procedure can be followed, except brushing the coats instead of spraying them. In this case, however, the bronze powders will have to be mixed with a varnish bronzing liquid, instead of with a nitro-cellulose lacquer bronzing liquid, since the lacquer bronzing liquids dry so rapidly that they can not very conveniently be applied by brushing on large surfaces.

Several well known paint, varnish and lacquer houses can supply either type of bronzing liquids. The bronze powders can be best obtained directly from bronze powder manufacturers.

Antique Gold Effect

Various different methods are used for producing the antique gold effect. Sometimes a coat of a contrasting shade of bronze powders is applied over a coat of brighter powder, and then the top coat is wiped off, so as to show the brighter powders through in certain places and to cover these powders up in other places. In this case, it will be necessary to use varnish bronzing liquid instead of lacquer bronzing liquid, so that the wiping operation can be performed.

Others get an antique effect by spraying on a mist coat of antiquing stain, putting the stain very lightly on certain portions and heavier on other portions, so as to give the antiqued effect.

Instead of a turntable below, we have here a revolving framework above, from which is suspended hooks to carry parts of K. D. furniture to and from the spray-gun operator who stands directly below the center of the wheel. A helper loads and unloads the hooks.

Still other concerns reduce ordinary colors ground in oil, or colors ground in japan, and apply these to the surface on top of the gold bronze coat, either by brushing or spraying, and wipe out to produce the desired antiqued effect before the coat of oil color or japan color has dried. Either turpentine or naphtha is ordinarily used for reducing these paste colors to a very thin consistency, for use as antiquing glazing.

Varnish Rubbing Trouble

Regarding the varnish rubbing trouble, I am inclined to feel that: (1) the varnish is being rubbed before it is thoroughly dry, (2) too coarse pumice stone is being used, or (3) the rubbing oil which is used can not be wiped off clean, as being the causes of the smutty appearance on the

rubbed varnished surfaces. The varnish should be thoroughly hard and dry before attempting to rub.

No. 2F pumice stone is about as coarse as should be used for the rubbing operation. Plenty of rubbing oil should be used with the pumice stone and not too much pressure used; otherwise there will be scouring and scratching of the varnished surface, which will show up as gray and smutty after the rubbing oil has evaporated.

The rubbing oil should not contain too much grease; otherwise it can not be wiped off clean after the work has been rubbed, and when it finally evaporates, it will leave a small quanity of pumice stone slush behind to give the smutty effect. There are made and sold by varnish companies special types of deblumed rubbing oils which do not contain so much grease, and which can be wiped off clean without this smutty look. A mixture of a neutral soap and water to give a good suds, is as good as anything for washing off the surface to brighten it up.

Might Try Lacquer

Since speed of production is one of the most important points to manufacturers of store fixtures, I should imagine that a good grade of clear wood lacquer would work very advantageously from the standpoint of time consumed in producing the finish, and the quality of the finish as well. It might pay to investigate the possibility of replacing the rubbing varnish with a good grade of clear wood lacquer, or to try another brand of rubbing varnish.

Good work that lasts is the finishers best advertisement.

Furniture Finishes

While there are certain types of finishes, such as mahogany and walnut, that are always popular, sometimes the public develops a fad for special effects in enamel or lacquer. The management of a plant that watches closely this trend, and meets the public's desires will profit.

After all, furniture manufacturing success depends largely on salesmanship, and in this case the finish is what counts most. Furniture of the finish that appeals to the public will sell quicker than other products not so attractively finished, regardless of quality of construction. The finisher therefore is, in a sense, the "Power behind the throne" in the success of his firm.

A wide range of colors became common practice for motor cars, with the advent of lacquer.

Colors in great variety, but kept within the limits of good taste, are in urgent demand.

Wood Grain Reproduction

The Wood Grain Reproduction Co. of New York, Inc., is now fully established at 141 East Ave., Long Island City. This shop is devoted primarily to the handling of the graining problems of manufacturers in Metropolitan New York. It is operating on a production basis and uses the graining equipment for the faithful reproduction of wood grain and marble, as manufactured by the Vance Manufacturing Co., Dayton, Ohio. The plant is under the direct management of Mr. T. S. Buchanan, who has had a long experience in the finishing field.

This company also acts as sales representatives for the Vance Manufacturing Co. for the entire Eastern Market.

The shop is open for inspection at any time to those who wish to see this exceptional equipment in operation, and the methods used in securing actual reproductions of wood grains and marble.

Industrial Finishing

PRACTICAL PUBLICATIONS, Inc.
Publishers
Room 603, 222 E. Ohio St.
Indianapolis, Ind.

Issued monthly. Distributed exclusively to executives and foremen finishers in all kinds of industrial plants where finish coats are applied.

JUNE, 1926

Reproducing the Natural

Reproduction of various natural effects which excite admiration for their beauty, their novelty, or the associations they bring to mind—this has become an increasingly important phase of the present finisher's art; it is something that is being practiced more and more in connection with the application of coatings designed for protective and decorative purposes. This reproduction of the natural supplies a welcome variation from severely correct solid color schemes and geometric embellishment.

Familiar reproductions which come to mind offhand include wood, leather, fabric and marble graining and coloring reproduced on surfaces of wood, metal or composition material; also painted pictures and inlay reproduction, reproduction of metal on wood surfaces, and the reproduction of various aged effects through staining, shading, highlighting, etc.

Faithful reproduction of true natural colors, grains and appearances is indeed an interesting art. It would require an army of skilled artists to do even a small portion of the kind of this work that is now performed so easily, quickly and successfully in the finishing rooms of industry today, were it not for the fact that much ingenious, labor-saving equipment now available is employed to good advantage in the work.

Decalcomania transfers, bleaching agents, blending and uniforming stains, and in fact all modern finishing materials, as well as grain-reproducing equipment, spray guns, stencils, masks, shields, abrasive materials, rubbing and buffing machines—all these and more are used by finishers to reproduce faithfully, economically and quickly the beauties we so much admire.

The fact that this work can be performed at comparatively low costs through the use of dependable materials and improved labor-saving apparatus is a credit to the industry. As a result there is just that much more beauty and inspiration available to a greater number of people.

Controlled Air

The time of year has arrived when sudden changes in the weather—changes in temperature and humidity—have a direct and abrupt effect on conditions inside factories where, throughout the summer and autumn months, so many doors and windows are open and no interior heat is employed.

Some materials to be finished, some finish coatings and some finishing processes are not noticeably affected by this variation of air conditions inside a building where no effort is made to control the air and keep it within certain defined limits as to

temperature, percentage of moisture content, and circulation. Others are.

It is a matter of good management, however, for each user of paints and finishing materials to learn whether or not changes in the temperature and humidity of air, occurring frequently throughout the warm weather period, will affect any articles before, during or after the time they are finished, and if so, to what extent.

Since last summer many concerns have changed materials and methods, and as a result they face new problems now. It is well to keep in mind that air conditions are frequently a very important factor in the success or failure of a finishing process.

Means are available for controlling the condition of air in the finishing room independently of outside weather conditions, and this can be done without discomfort to workmen or great cost to management. It's an engineering problem for the experienced heating and ventilating engineer, but many concerns who supply finishing materials and equipment have in their employ technical men who are qualified to make recommendations along this line. This information is available along with the concern's other service. Estimates on the cost of the work will be gladly furnished by a local installation engineer, or by concerns who manufacture heating and ventilating equipment.

The primer coat for metal panels must have sealing qualities to keep out moisture.

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Finishing Furniture in Colors—II

Second installment of two-part article which contains information on color pigments and color mixing that is of timely interest and value to many foreman finishers

By A. Ashmun Kelly

THERE are hundreds of colors, tints, hues and shades of paint to choose from, most of which will have no interest for the furniture painter. The following list embraces such as will probably be of practical use.

Ashes of Roses. Tint pink paint with a very small amount of drop black.

Carnation. White 12 parts, scarlet lake one part. Zinc oxide may be used if preferred, in place of lead; 16 parts to one part of the lake.

Geranium Pink. Zinc oxide 60 parts, geranium lake one part.

Note: It is impossible to give quantities in parts in all the formulas, owing to the minute amounts required.

Old Rose. To a very little white add Tuscan red and drop black. Or, rose madder or carmine, white, and a drop of black.

Peach Blossom. Tint white with King's yellow.

Shell Pink. White 50 parts, English vermilion two parts, orange chrome yellow one part, burnt sienna one part.

Rose. Tint white with carmine.

Carnation Rose. Zinc oxide 8 parts, rose madder one part.

Rose Tint. White 16 parts, rose pink one part.

Azure Blue. Zinc oxide one part, ultramarine blue 1/40 part.

Sky Blue. White 99 parts, Prussian blue one part.

Absinthe Green. Tint white with Paris green.

Moss Green. Mix Prussian blue, medium chrome yellow, raw umber and white. Or chrome yellow, raw umber and white.

Olive Green, light. White 70 parts, yellow ochre 15 parts, medium chrome yellow 5 parts, raw umber 6 parts, drop black 4 parts. For *dark olive green*, yellow ochre and lampblack.

Willow Green. Verdigris and white.

Tea Green. Raw umber, chrome green, and yellow ochre.

Acorn Yellow. Equal parts of white lead and raw sienna.

Canary. White lead 80 parts, lemon chrome yellow one part.

Canary Yellow. White lead 6 parts, lemon chrome yellow one part.

Cane. Color of cane furniture. Tint white lead with yellow ochre, and slightly darken with a little burnt umber.

Colonial Yellow. White 95 parts, yellow ochre 3 parts, and lemon chrome yellow 2 parts.

Cream. White 98 parts, yellow ochre 1½ parts, lemon chrome yellow ½ part.

Golden Tint. White 30 parts, yellow ochre 5, and vermilion one part.

Golden Yellow. Take lemon chrome 10 parts, orange chrome 2 parts, white 2 parts.

Old Ivory. Tint white with raw sienna.

Ivory. White 98 parts, raw sienna one part, lemon chrome one part.

Ivory White. A very fine, clear, but rather expensive ivory

The foreman who asks

The finishing foreman who asks us a question that keeps our laboratory staff up on its toes till the answer is found . . .

He may imagine we are doing him a favor. He may feel sort of ashamed not to be able to send an order along with the question.

He needn't. He is doing us the favor!

Anything that comes up to puzzle a man in a finishing room is a thing we ought to be glad to find the answer to . . . and we are.

Look at it that way . . . that it's OUR job to puzzle it out for you . . . and put your shop worries up to us. We'll thank you for doing it.

Laboratory Ours is one of the biggest in the industry, and nobody has one better-equipped to find out anything you need to know. As we said, it is at your service, net!

Plant All we sell, we make; and we make it expecting to compete with anybody on a basis of quality plus performance in the finishing room.

Product Our output is Varnishes, Lacquers, Enamels, Stains, Fillers, Undercoats, and a Sub-Shellac which suits a whole lot of foremen and bosses.

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white may be obtained from the formula, French yellow lake 2 parts, raw Italian sienna one part, zinc white 97 parts.

Jonquil. Tint white with medium chrome yellow.

Primrose. Medium chrome yellow comes very near it.

Straw Color. White 90 parts, yellow ochre 7 parts, medium chrome yellow 3 parts. Or, white 8 parts, medium chrome yellow one part.

Sulphur Yellow. Equal parts of white and lemon chrome yellow.

Transparent Yellow. Yellow lake makes the best, but a cheaper color can be made by using Dutch pink (which is not a pink). Or, zinc white 8 parts, yellow lake one part. Gamboge gives a bright color.

Flesh Tint Yellow. White 80 parts, light cadmium yellow one part.

Buff. Two parts white lead, one part yellow ocnre. For deeper tone, tint yellow ochre with Venetian red. For *light buff*, reduce yellow ochre with white lead. For *medium buff*, add some white lead to yellow ochre and tint with a little burnt sienna. Or warm up with Indian red, and darken with burnt umber. Equal parts of white lead and yellow ochre give *stone buff*. For a *brilliant buff* use the best grade of golden ochre.

Café au Lait. White, burnt umber, and medium chrome yellow.

Dove. Tint white with vermilion, Prussian blue, and a little medium chrome yellow.

Gray. Shade white with a very little each of blue, red and drop black. Usually this color is made by taking the white base and adding a very little blue, then a little red, or burnt sienna, and mixing each color well into the mass.

Lead Color. About 98 parts of white lead and 2 parts of lampblack.

Mahogany. Golden ochre 5 parts, Venetian red 2 parts.

Peach. Tint white with yellow ochre, vermilion and black.

Pearl Gray. White lead 98 parts, drop black 1½ parts, Tuscan red ½ part.

Silver Gray. White 97 parts, yellow ochre 2 parts, lampblack one part.

When a formula calls for certain pigments and does not give the proportions of each, the importance of each is indicated by the order in which it stands. Thus, say white, yellow and blue are the component parts; take first the white, and add to it the next named color—yellow; mix in, and then mix in the last named.

Some fine effects can be obtained by what is called scumbling, and which is done as follows: First make your ground; say it is a cream. Then take, we will say, a mixed paint of raw or burnt sienna, and dab it on with a rag, or apply with a brush and follow by wiping off here and there, producing a mottled appearance. Colored varnishes and lacquers may also be used to good effect, and are especially adapted for the cheaper grades of furniture, as they require less work.

The top coat of any finish must be firm and durable to withstand handling and polishing, and yet not be too sensitive to atmospheric conditions.

The durability of any finish relies much on the elasticity of the top coat.

"What I like best about the men who make up the Murphy Varnish Company is the sane way in which they look at their own job—not the largest varnish makers in the world, not the only makers of good varnish, but merely the determination that all the varnish they make shall be good."

AT LAST—

A satisfactory filler for use under lacquer!

Murphy Kauriol Wood Preparation is a pyroxylin stain, filler and waterproofing material which makes a perfect base for lacquer finishing coats. Being itself a lacquer it is free from the tendency to turn gray which is characteristic of oil paste fillers when used under lacquer.

Not only does this new product give superior results but it achieves a saving in costs at the same time. Its use decreases the number of finishing operations, and shortens drying and labor time. One radio cabinet manufacturer tells us that by adopting Murphy Kauriol Wood Preparation he cut his finishing costs forty cents per cabinet.

We are sure you would be interested to see a demonstration of this new Murphy product. Won't you drop us a line so that we can arrange one at your own plant some time soon?

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KAURIOL Wood Preparation

MURPHY VARNISH COMPANY
NEWARK · CHICAGO · SAN FRANCISCO · MONTREAL

Questions and Answers

This service department is conducted to meet the readers' need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer comments, suggestions or answers.

Dahlia Stake Stain

Can you give us information for the best method to stain dahlia stakes with a green stain that will not rub off or wash off? We have tried different materials but have not found any to our satisfaction.—H. & E. Co.

Mahogany Finished Beds; Filling End-wood; Pinholes

We make four-post beds. Our greatest difficulty is in bodying up the end wood where the turnings are cut rather deep. The beds are made up in parts and assembled after being rubbed. The posts are rubbed in a lathe, the panels on a portable electric rubbing machine. Our present method is to do all sanding on posts between coats in the lathe.

We give the posts two coats pure shellac and two coats good grade varnish. In order to body up the end wood, the sanders have a pot of shellac alongside of lathe, and, with a 1 in. brush, build up the end wood while the post is revolving. Of course, it will take only a certain amount of shellac. This bodying up is done at each sanding. Can you suggest any method of bodying up the end wood that will be more efficient and less costly? Posts are made of quartered sap and red gum.

Another difficulty we have is with pinholes on our mahogany panels. We have before us Mr. John H. Steffen's articles in the April issue. Our process is practically the same as outlined, but in order to avoid pinholes we must fill the panels twice. Panels are 5-ply.

We have tried a half dozen different fillers (price no object) and invariably have pinholes. Our double filling entirely eliminates pinholes, but delays production 48 hours and adds the filling cost to the cost a second time. Any assistance in these matters will be appreciated.—S. F. Co.

Lacquering Body Panels

We are located in Australia and our main problem is to satisfactorily lacquer the metal panels of motor car bodies, which have been previously treated with special foundation undercoats. Any information will be appreciated.—S. M. B. Co.

The exact procedure to follow in using lacquer over the metal panels of motor car bodies depends a great deal upon exactly what the special foundation undercoats, which you mention, may consist of. If these special foundation undercoats are in the nature of a primer and surfacing materials, such as are used in the United States, little difficulty should be encountered in using lacquer over them, provided the undercoats are constructed of the proper type and proportion of oils, varnishes and pigments to withstand the solvent action of lacquer.

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If these foundation undercoats are of some other type, which will not withstand the solvents in the lacquer, you have a more difficult problem to solve. In such a case there is little that can be done to make it possible to use lacquer over undercoats that are readily softened by the solvents, other than to very lightly spray on one or two coats of the lacquer, being careful not to wet the body very much; then let these coats dry and finally put on a full wet application of lacquer enamel in the regular way.

These first one or two dry mist coats of lacquer directly next to the surfacing materials act somewhat as a cushioning medium to prevent the solvents from subsequent coats of lacquer penetrating into the surfacer.

A more definite understanding of exactly what your problem is would be necessary in order to give you very much detailed information as to how to overcome it.—I. F.

Birch As Mahogany Or Walnut

What is best method to finish white birch in mahogany and walnut? Should I use oil stain? Is it all right to use filler directly over stain, that is after stain has been thoroughly dried? How can I get a good brown mahogany which is popular today in the furniture trade?—W. W.

The best method to finish white birch in mahogany and walnut in one plant might not be the best method in another plant. The construction of the object being finished depends upon the use to which it is to be put, and the quality of finish desired must be taken into consideration along with the facilities for finishing that may be present in any one factory, and the total length of time that can be allowed for finishing the object before any definite system or schedule is adopted.

Whether it is satisfactory to use an oil stain depends considerably upon the exact shade desired and the type of finishing material used in building up the finish. Few, if any, oil stains are as permanent to light as water stains, except in the redder tones, and, of course, oil stains should not be used under lacquer.

It is satisfactory to use filler directly over the stain provided the grain of wood has not been raised by the stain, as in the case of water stain. In such instances a washable shellac consisting of four parts of denatured alcohol and one part of four-pound cut white shellac, should be applied over the stain, allowing to dry at least five hours and then sanding carefully before the filler is applied.

By writing to any of the advertisers of finishing materials in this magazine you can undoubtedly get a shade of brown mahogany that would be entirely pleasing and satisfactory.—I. F.

Mahogany Antique Brown

Please give complete information as to all the operations and material required to produce the so-called "Antique" brown finish on mahogany and gum.—F. E. Ruger.

It is very difficult to give any complete instructions for obtaining an antique brown finish on mahogany and gum without knowing the exact shade desired.

TOUGHNESS!

Swedish Lacquer

A long step ahead in finish

An oil lacquer for furniture
that wears well under
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The originators of No. 115
PALE RUBBING VARNISH

In other words, there is no standard shade of antique brown, and the shade will vary somewhat according to the type of stain, filler and other finishing materials used.

Roughly, the system would consist of staining the work with the proper shade of stain, then filling it and, on top of the filler, applying an antique stain to those parts which are to appear darker when finished. On top of this shellac, varnish or lacquer can be used for completing the finish.—I. F.

Black Baking Japan

At present I am using, on my finishing coat, a black baking japan made of asphaltum, linseed oil and dryer. This material I boil myself and for gloss it gives very satisfactory results, but I desire to get away from the brownish cast so noticeable in the sunlight.

My first coat is a lamp black proposition and covers nicely. What I desire to obtain, however, is a jet black proposition to go over both steel and wood, with a gloss equal to that I am now obtaining. The best readings of these enamels is 38 and bake at 250 degs. by steam in four hours. Each of my tanks hold about 1,000 gallons.

Can you suggest any way in which I may treat the asphaltum-linseed oil mixture to obtain a jet, glossy black which will satisfactorily cover, and give the same high gloss, in two coats, that I am now getting?—J. V. P.

The brown cast in your finishing coat is undoubtedly due to the asphaltum, and since the preparation of finishing materials, such as you mentioned, is an art within itself, to which many people have devoted their entire lives, we suggest that you will probably be able to get the type of material you wish from one of the paint and varnish manufacturers at considerable less total cost to you than if you attempted to manufacture your own.

It is possible, by combining certain materials with asphaltum at the time of cooking it with the oil and drier, to get a jet black color when viewed in the sunlight, without affecting the gloss or other desirable properties, but only thoroughly experienced paint and varnish manufacturers are able to produce this type of baking japan economically.—I. F.

Mahogany Veneered Tops

We are having trouble in finishing mahogany veneered tops. After filling these tops and wiping them off there will appear, on the surfaces, small damp pimples, and it is necessary to re-wipe the work. Could you give us a remedy? The mahogany veneer is 1-20 in. thick on a poplar core.—I. C. C. Inc.

There are several causes for pimples and bubbles to form on freshly filled work, such as you describe, and it will be difficult for us to definitely point out the exact cause of your trouble without knowing all the conditions surrounding the laying of the veneer, the application of the filler, the kind of naphtha used in the filler, the drying conditions at the time of filling, and the quality of the veneer and the filler.

However, we will point out some of the causes of this trouble and by checking up on them perhaps you can locate the source and remove the cause. Poor ve-

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neer, and especially a soft, porous mahogany, has all of the causes of this trouble. The pores are of such a nature that it is difficult to get the filler down to the bottom of them. This allows some of the air in the pores to be intrapped, and later it comes out in the form of bubbles, especially if there has been a change of temperature after the filler is applied.

To eliminate trouble from this cause, the first step is, of course, to use better veneers. If this is not possible, then it may be necessary to resort to double filling, reducing the first coat of filler until it is quite thin, say about 8 lbs. of filler to the gallon of naphtha, and applying the second coat considerably heavier, say about 12 or 14 lbs. of filler to the gallon of naphtha.

The second cause of this trouble is in the nature of the naphtha used. Certain grades of naphtha contain a greasy residue which is not quickly evaporated. This may result in the filler taking an initial set, so that it appears dry enough to be wiped off, yet there will be enough of this greasy residue left to evaporate after the filler has been first wiped off, and it will cause pimples or bubbles.

The remedy here is to test your naphtha for the greasy residue, which can be done by pouring the same amount out on a piece of clean white paper and hanging the paper up to dry. If the naphtha is safe to use in the filler, all of it will evaporate from the paper and leave no stain or greasy mark behind after being exposed to the air for twenty or thirty minutes. If this test shows a greasy circle on the paper after a half-hour's exposure to the air we would recommend that you try a different brand of naphtha.

It may be that the filler itself is of such a character that it is responsible for this trouble, and in case all of your other tests fail to remove the trouble we would suggest that you try a different make of filler.—I. F.

Stain Drying—Ventilation

How long should water stain dry before applying yellow shellac?

What kind of room and temperature should shellac be worked in? Should the room be mechanically ventilated so as not to cause a draft?

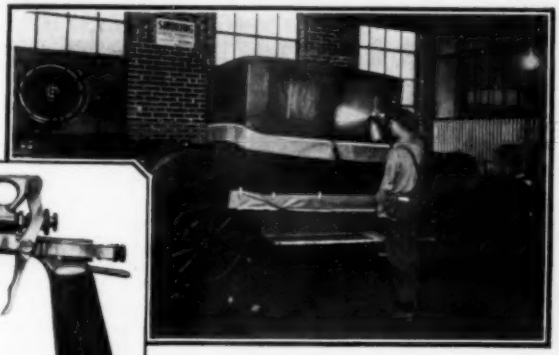
How should a varnish room be ventilated?

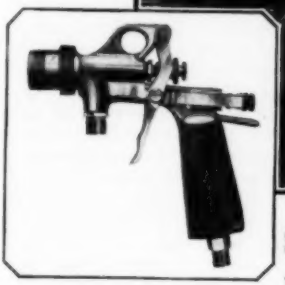
How is the best way to regulate heat in varnish room at 90 degs. F.?—D. W. C.

The length of time required for water stain to dry, before applying any kind of shellac, depends on the temperature and humidity of the room, and on the quality and durability of finish desired.

On good work, and when dried in the open shop in the usual temperature of 65 to 70 degs. F. I have never thought it wise to coat over water stain the same day that it was applied. If you have a drying room kept at a temperature of 110 degs. F., you can dry it here in from 3 to 4 hours.

Shellac is better if applied in a room the temperature of which is not lower than 65 degs. F., but a temperature of 70 degs. F. is better. The humidity should be low, since the solvent in shellac has an affinity for moisture, and will draw it from the air if the humidity is high. That is why shellac sometimes takes on a





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greenish cast when applied in a high humidity, or near an open window, or in a draft. Mechanical ventilation is better than depending on opening the windows.

Electric fans are now used for ventilating modern varnish rooms, unless the room is heated with washed air, in which case the heating system takes care of the ventilation.

To maintain a uniform temperature in the varnish room it is necessary to have an automatic heat control mechanism attached to your system. There are different types of these on the market, some of which can be attached to any heating system.—C. L. Toman.

"Automobile Refinishing" Recommendations Challenged

The writer has just received the May copy of INDUSTRIAL FINISHING, and is impelled to comment on the article entitled "Automobile Refinishing" by R. J. Birnel.

I shall preface that which is to follow by stating that your magazine affords the opportunity of assistance to workers in all lines of the finishing field and in the main, so far, it has contained much of practical value to the artisan. But there are times when published matter is erroneous and liable to occasion the person following it in practice considerable grief and loss.

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It would be fair to assume that the author in this case is a lead-and-oil painter, as all his recommendations prescribe what is virtually house paint composition for automobile refinishing materials, to wit:

Page 10—*"Lead Glazing,"* as white lead in oil in consistency of a medium thick paint, and to be followed by *"Lead Paint"* of similar makeup; whereas proper glazing putty requires good varnish for hardening of the heavy mass of filling in the depressions wherein applied, and varnish character of vehicle in the lead coat subsequently applied.

His description of *"Rough-Stuff"* better applies to the ordinary paste wood filler. High grade rough-stuff does contain white lead and does not contain silex, and its vehicle is a combination of prepared oil and very good rubbing varnish. Wherever first class body finishing is the custom, rough-stuff is applied and reapplied to provide or build up sufficient body for a beautiful full and round finish in the completed job, contrary to the statement that rough-stuff is only a filler intended to be rubbed away to the preceding lead coat.

Further, on *page* 11, "The Ground Coat" also is reported as color-in-oil with a little drier, whereas generally japan colors are used, although others resort to colored sealer-coats in which the vehicle is mainly light-body varnish and gold-size japan.

On *Page* 12—"For Lacquer Finish," it is remarked that varnish does not bind well to hard surfaces (which it does) whereas the fact is that varnish does not bind well to oil-vehicle coatings on which its great tendency is to crawl. The inconsistency in the matter is wherein the author ad-

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Paasche paint spraying equipment is made to spray any material —from the thinnest varnish to the heaviest lacquer. By using Paasche equipment throughout—compressors, air-conditioning units, airbrushes, and ventilating equipment—you secure the best finishing results at a minimum cost. Ask our engineers to study your finishing problem.

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Material to be applied.....

How many airbrushes do you now use?.....

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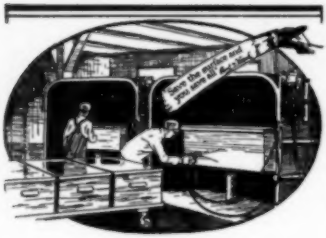
What size compressor have you?.....

IF 6–Gray



Makers of Cedar Chests

. . . . will welcome with open arms a material which will not perish thru the destructive action of oil of cedar.

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Wood Spraying Lacquer No. 104

. . . . is what we have to offer. This is just one of the paint and varnish problems that has been solved in the research laboratories of *LUCAS*.

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Built up sections of Cedar Chests—with varying amounts of oil—show an even finish thruout—when protected with this lacquer.

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vises in this paragraph that the foundation for lacquer must be hard to withstand the lacquer, when up to this point all his recommended materials for undercoating the work have been oil goods.

Page 13—"From three to five lacquer coats are usually applied" and this is correct, but to advise that each coat be given a sanding is neither practical nor necessary. Lacquer coats are so very thin that repeated sandings would require a greater number of coats to produce the ultimate solid-covered job.

Each sanding necessitates thorough cleaning off, or else the particles become imbedded in the subsequent coats to cause a very bad condition that then does require a lot of surfacing to remedy; whereas even in the best shops one coat of lacquer follows another, the last coat is carefully sanded down and cleaned off, a mist coat then sprayed over all which cuts the surface and obliterates all scratches—blending the whole into a perfectly smooth and uniformly even finish, ready for the final soft rubbing and polishing.—E. Perry.

That Crackle Finish

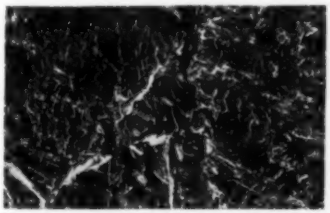
In the April issue, page 67, is an article on "Crackle Finish," submitted by one "J. I. C."

In our experience, we have found the use of the materials to be just the reverse to that described in this article. A soft, elastic, slow-drying undercoat is put on first, and over this a non-elastic, quick-drying finishing celluloid lacquer. It is the movement of the undercoat that makes the top inelastic coat crack so that the undercoat shows through.—Hilo Varnish Corp.

Imitating Marble Finish

A question entitled, "Imitation Marble Finish," was taken from the May issue of INDUSTRIAL FINISHING, which reached our desk this morning.

Under separate cover, we are sending to you a sample of marble reproduction as accomplished by our graining equipment. This marble finish has been put upon a piece of "Newtile," a product manufactured by the Asbestos Limited, Millington, N. J., one of our newest users.



Typical sample of imitation marble finish on a thin composition panel. Surface is smooth and hard and has polished marble luster.

The materials and operations used in producing this finish are as follows: Lacquer ground coat in black, a light hit or miss spray of green, white graining compound, the grain impression taken from our graining plates through the medium of our composition rolls, two coats of clear lacquer finish, rubbed and polished. This same result can be secured through paint and varnish or a combination of paint ground color and clear lacquer.

Through the use of this equipment, the most ordinary labor in any plant can secure exactly this result and this finish can be put over any smooth surface of wood, steel or any substitute material.

We make equipment to reproduce any wood grain or marble

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and the method of securing the different finishes is the same as described above.—The Vance Mfg. Co.

Dipped Lacquer Bubbling

Referring to P. S. M. Co.'s inquiry in May issue, there are two frequent causes of bubbles in dipped lacquer finishes, and the trouble may be due to either of these or a combination of them.

If the lacquer is applied too heavily or without enough reduction there is a tendency for a top skin-film of partially dried lacquer to form before enough of the solvents have evaporated from the lower portion of the film. When these solvents evaporate they cannot escape as fast as they are liberated and they cause the top film, which is partially dry, to raise up in the form of a blister or bubble. This trouble happens especially where more than one coat is used.

The second cause of blisters or bubbles on dipped lacquer work is the too frequent application of the coats, that is, not allowing sufficient time for one coat to dry before the next one is applied. While most lacquer enamels will be surface dried and free from tack within 15 or 20 minutes after being applied, they will not be hard all the way through the film, and will contain a considerable quantity of unevaporated solvent.

If another coat is applied within this short time the bottom coat will be softened up too much, and the same general action will take place as where the lacquer is used too heavily, that is, the second coat will surface dry before enough of the solvents have evaporated and may cause

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bubbling, especially if the material is a little heavy.

It is suggested that at least an hours drying time be allowed between coats; this will probably eliminate the trouble. If it does not, then reduce the lacquer to a slightly thinner consistency and try it. If the lacquer is dried between coats and if it is not too heavy or viscous, the bubbling trouble will not appear.—I. F.

Why Lacquer Peels

In reply to D. A. P. S., who makes inquiry in May issue, under the above heading, it is not possible to give a definite cause for the lacquer finish peeling off around mouldings within 24 to 48 hours, without knowing more details of how the old finish was removed and the new finish built up. Peeling around mouldings, however, is usually due to one of three causes or a combination of them.

Probably the most common cause is the presence of traces of moisture, paint remover, caustic, oil, grease or other foreign materials behind a loose moulding which comes out and prevents the lacquer from sticking. All such materials must be thoroughly removed by wiping with clean cloths, blowing out with compressed air and, if necessary, heating moderately with a blow torch before the finishing operations begin.

The second common cause is what is commonly known as "bridging." Some lacquer materials have the unhappy fault of pulling themselves together as they dry, much as a rubber band would, so they leave a pocket of air under the lacquer film in corners, crevices and around mouldings.

The third cause is a very loose moulding which changes its position slightly, due to vibration or to changes in temperature after the lacquer is on. This causes the lacquer film to break. —I. F.

Finishing Those Pedestals

Referring to the inquiry of B. B. Co. in May issue, entitled "Finishing Pedestals Cheaply," we believe that undoubtedly you would be able to save considerable money in your finishing operations by using a flat varnish to replace the rubbing varnish as the last coat.

We can not recommend one varnish in preference to another, but there are a number of reliable paint and varnish manufacturers who are regular advertisers in this magazine, and by getting in touch with one or more of these firms you will be able to secure a product that is entirely suited to your requirements.

As to whether you can apply your coats of substitute shellac and flat varnish by dipping instead of by brushing on the lathe, depends upon the exact size and shape of the object to be coated. Flat varnishes have been dipped successfully on quite large objects when there was a satisfactory method for holding the objects so the varnish could drain to one low point.—I. F.

Traffic Line Markers

This is a reply to numerous inquiries received from time to time in this office, for a machine to mark traffic lines on streets and highways. There are several spray painting devices of this type on the market.

One is the Ault Traffic Line

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Spray booths are designed by Peerless engineers to meet the requirements of special work. The type shown above is in use by large moulding manufacturers. This is merely indicative of our radical departure from spray booths of general design to meet individual requirements where necessary.

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Marking Machine, made by the Tennessee Tool Works, of Nashville, Tennessee, which is claimed to "Paint as fast as man walks." It consists of a compressed air tank, a paint tank, a spray nozzle operating between two guides which control the width of the line, and rotating brush which cleans the surface in advance of the spray, all mounted on a hand-propelled wheeled carrier.

While the air tank in this case is filled in advance with compressed air at 100 pounds pressure, there is no apparent reason why an ordinary carbonic acid soda fountain cylinder provided with a pressure reducer should not be substituted.

Another device widely used for the same purpose is the "Spraco Traffic Marker," made by the Spray Engineering Co. of Boston, Mass. It consists of a special spray gun mounted on wheels with side shields which govern the width of the painted bands. A gasoline driven air compressor and the paint tank are carried on a separate automobile truck.

A third and simpler device is the Hampden Marking Machine, made by the Hampden Supply Co. of Springfield, Mass. This consists of a four-wheeled hand truck carrying a paint tank and a marking-pad wheel. The paint is distributed by gravity to the wheel pad, which paints the white zone line as the truck is pushed forward. It is as simple as a hand cultivator.

Killing Red in Walnut

In reply to M. & S. F. Co.'s question in May issue of INDUSTRIAL FINISHING, this problem is not a new one. I suppose nearly all finishers have had more or

less experience with red patches that sometimes occur in a beautiful flitch of veneer. There may be a chemical on the market which would bleach these red patches out for you, but I would be cautious as to its use, for you would be in danger of ruining succeeding coats of finish later applied. This is one of Nature's freaks and, as we all know, Mother Nature is not easily outdone.

If you are finishing your goods in dark American walnut your finisher, no doubt, could mix an opaque stain and, with the aid of a blending brush, obliterate these patches. If, however, your finish is French or Huguenot, this will be difficult to do.

In our plant we make up our own veneered stock and our superintendent, who happens to be an old finisher of some 30 years experience himself, realizes the difficulties under which a finisher is often placed. He goes in person to the veneer mills and selects his own veneers, being careful not to buy anything that is going to be used in tops, fronts or ends of cases that are not free of these blemishes.

I could name several bleaches, such as chlorinated soda, chlorinated lime, phosphoric acid, etc., but I have tried all these with little or no success on natural discolorations. Try using this veneer in the interior of your case goods, such as back panels for chinas, insides of buffet doors, etc.—Roy L. Knall.

The most prevalent method of uniforming the shade of walnut or other woods, where the finish is to be fairly dark, is by the use of "shading" or "over-toning" stains, which are brushed on

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those parts where needed after the regular stain and filler have been applied, and dried, but before the finishing coats of shellac, lacquer or varnish are applied. In other words, the wood is all stained in the regular way without regard to the original color of the wood, then filled and finally touched up by brushing on the proper shade of shading stain to uniform the color of the work.

Where the shade of the walnut finish is quite light this method is replaced by the use of a bleaching agent on the bare wood. Several chemicals are used for this purpose. The red tone is often killed with either a weak solution of picric acid, or with a solution of sodium hypo-sulphite to which about one dram of water soluble blue to each gallon has been added to neutralize the red tone. A solution of this kind should be applied only to the parts on which the color is to be changed.

Another method that is sometimes used is to mix a small quantity of pigment colors into the bleaching solution. As the solution is wiped on with a cloth the pigment has a slight staining action that helps to unify the color of the wood. A wash coat of shellac is usually applied after this pigment-bleaching solution has dried. The wood is then sanded smooth and the finish proceeds in the regular way.

So far as we know there has been no one single method developed for killing the red tone in walnut that is universally satisfactory. The finisher must develop a method of his own that fits the particular color of work he is turning out and the working conditions in his shop.—I. F.